K-5

CITY OF LODI
COUNCIL COMMUNICATION

AGENDA TITLE: **Approve Issuance of Request for Proposals for Turnkey Solar Demonstration Project at the White Slough Water Treatment Control Facility (EUD)**

MEETING DATE: **August 19,2009**

PREPARED BY: **Electric Utility Director**

RECOMMENDED ACTION: Approve issuance of Request for Proposals for a turnkey Solar Demonstration Project at the White Slough Water Treatment Control Facility.

BACKGROUND INFORMATION: Significant progress has been made over the last five years toward making solar energy resources a viable electric utility scale resource technology.

Staff is proposing that the City solicit proposals for the installation, operation and maintenance of a relatively large scale solar project at its White Slough Water Treatment Control Facility. Some of the benefits of such a project include:

- Showcasing a renewable energy project at a site adjacent to and visible from Interstate 5;
- Obtaining experience with solar energy technology;
- Exploring the economics of solar energy systems available today;
- Helping to demonstrate innovative renewable energy technologies and promoting eventual product commercialization and enhanced economics; and
- Enhance Lodi's reputation as a community welcoming new green businesses.

The proposed site would be a triangular parcel owned by the City which is adjacent to I-5. This site has the potential for 100 to 300 kilowatts of installed solar capacity. The project would be "behind the meter" of the treatment plant at White Slough and the electricity generated by the project would reduce White Slough's demand on Lodi Electric Utility (LEU).

Some of the key parameters of the Request for Proposal are:

- Projects are to use solar photovoltaic technology and may be fixed or tracking and flat panel or reflecting;
- Projects would be turnkey. The Proposer is responsible for all aspects of the project including permitting, financing, installation, operation and maintenance;
- An in-service date prior to June 1, 2010 is preferred;
- Term would be 25 years with an option for the City to buy (and operate) the project any time after five years at a predetermined price or formula;
- Minimum size would be 100 KW. Maximum size would be dictated by the limits of the site;
- Purchases would be made pursuant to a negotiated Power Purchase Agreement (PPA);
- Preferred pricing approach would involve an initial year price (cents/kilowatt-hour) with an annual escalation rate, if any;

APPROVED: _____
Blair King, City Manager

- Lodi Electric Utility would be granted all environmental and capacity attributes associated with the project to include, but not be limited to, greenhouse gas credits/allowances, air quality credits/allowances, renewable energy credits, resource adequacy capacity, local resource capacity, etc;
- LEU would be responsibility for relocating a power pole on the site if it interferes with a proposed project;
- The purchaser of the solar energy would be the City of Lodi's White Slough treatment facility.
- The Project would be eligible for a California Solar Initiative (CSI) Rebate from LEU as per the utility's rules and regulations regarding the CSI that are then in effect. It is expected that the rebate would be provided to the customer, not the Proposer.
- The Project would comply with all terms and conditions related to interconnection with LEU.
- Proposer will assist the City in showcasing its solar project and promoting the location of green technology businesses and jobs in Lodi. Project signage would be as mutually agreed.

In addition to considering responses to the solar RFP, LEU will also be reviewing solar photovoltaic proposals from its participation in the Northern California Power Agency Green Power Pool. The details of such solar energy purchase arrangements are still under development. Proposals will be evaluated based on which proposal is judged to provide the most benefit to the City of Lodi. Price will only be one element of the evaluation.

For a recent twelve month period, the monthly annual electric demand by the White Slough treatment facility is between 800 and 900 kilowatts (KW). The total electricity consumption during this 12-month period was about 7 million kilowatt-hours (KWH) resulting in an annual bill of about $500,000. (A 100 KW solar project will typically contribute 200,000 KWH or less.)

Solar photovoltaic technology is one which uses silicon semiconductor material to produce electricity. Typically, two types of silicon (P type and N type) are sandwiched together in a flat plate solar panel creating a collector that is sensitive to sunlight. When light (photons) strikes a solar panel, electrons are displaced from the silicon atoms and flow if the panel is part of a closed circuit. The flowing electrons create a direct "DC" electrical current. The DC current is transformed into alternating current "AC" through use of an inverter.

Photovoltaic cells are most often mounted at an angle and face south in order to capture the maximum amount of direct sun. To increase output (at a higher installed cost), solar cells can also be placed on tracking systems that follow the sun to maximize the amount of solar energy captured. Another type of solar array is one designed to concentrate sunlight. These concentrating collectors use a lens or a glass reflecting surface to concentrate more sunlight onto the silicon cells.

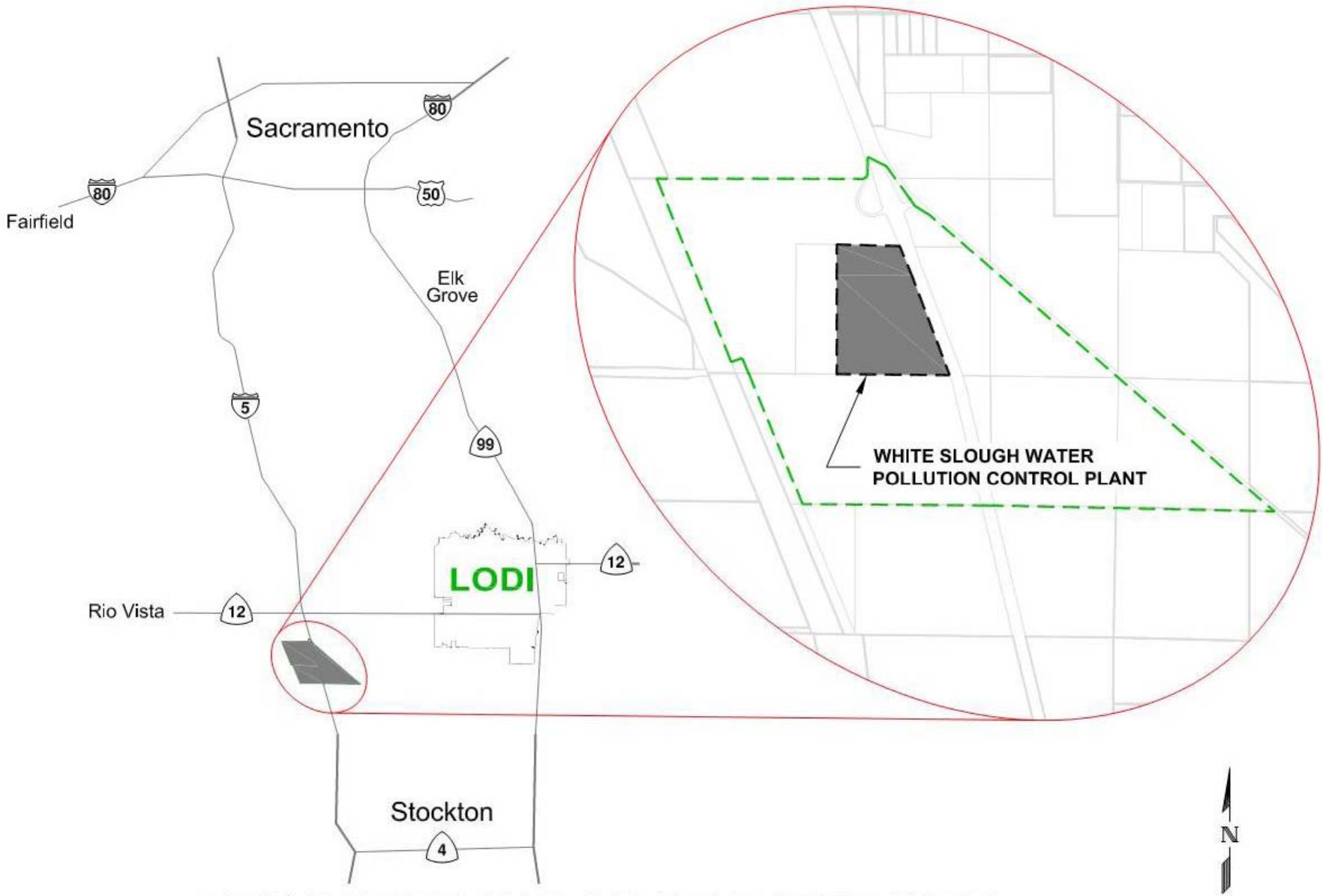
Attached are maps showing the location of the proposed project site.

FISCAL IMPACT: Electricity generated by the solar project will reduce conventional electricity purchases incurred by White Slough at little or no additional cost.

FUNDING AVAILABLE: The cost of purchasing electricity from the successful solar project will be paid from the Wastewater Utility's operating budget.

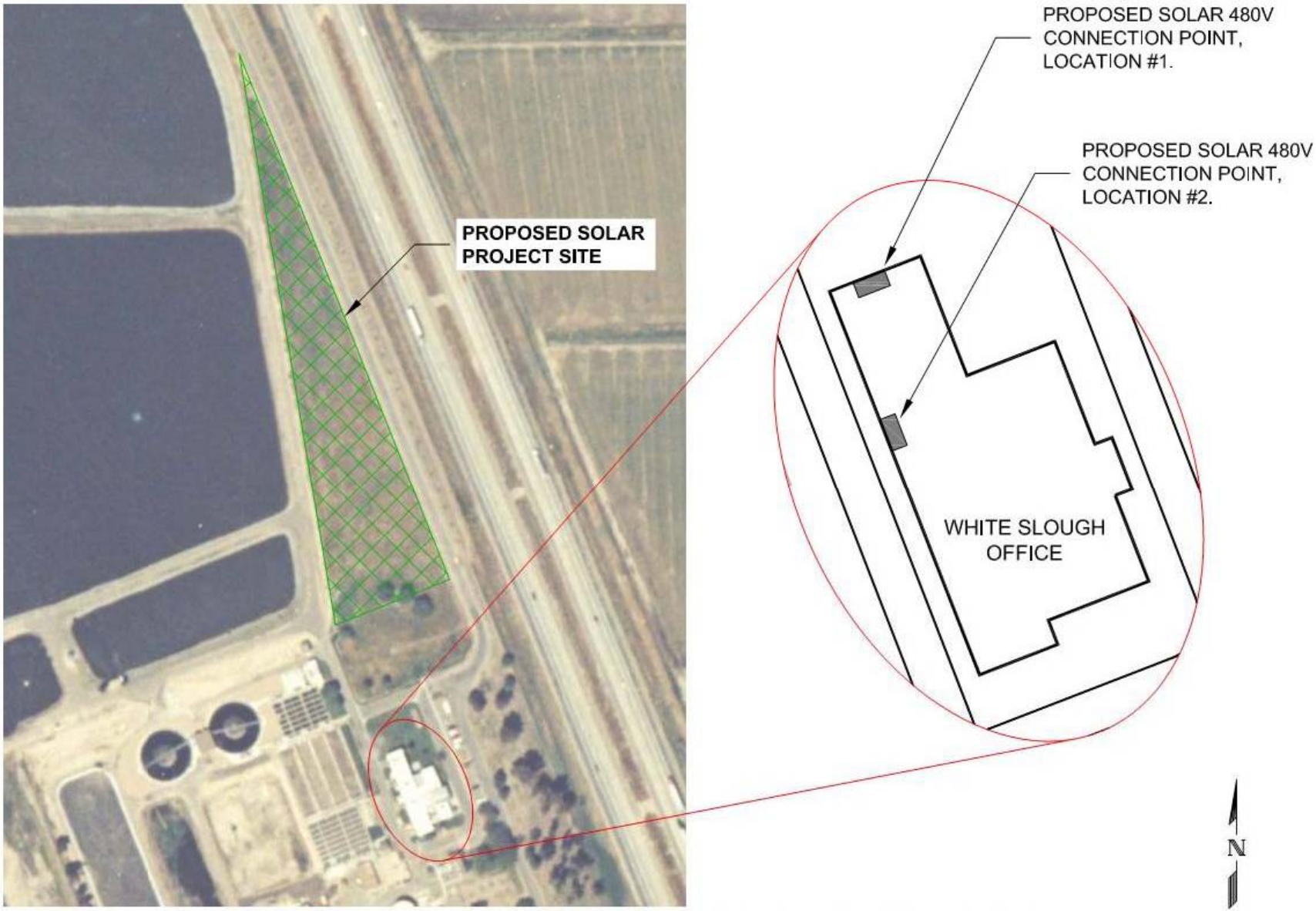
Jordan Ayers
Deputy City Manager/Internal Services Director

George F. Morrow
Electric Utility Director



PROPOSED SOLAR PROJECT SITE

WHITE SLOUGH WATER POLLUTION CONTROL PLANT



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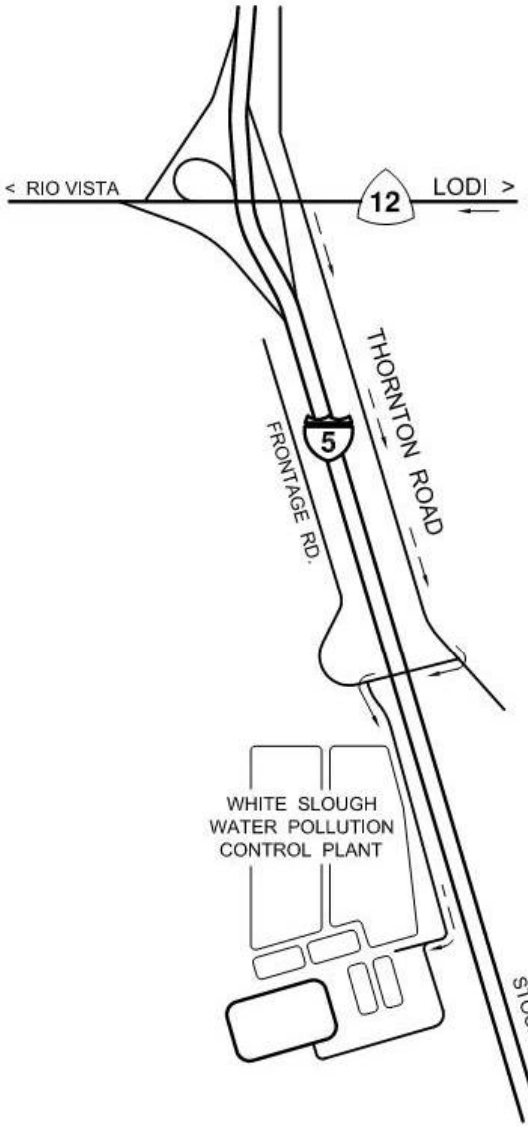


DRIVING DIRECTIONS:

LEAVING LODI, WEST ON HIGHWAY 12 TO THORNTON ROAD.
TURN LEFT AND CONTINUE SOUTH ON THORNTON ROAD.
TURN RIGHT ON THE I-5 FRONTAGE ROAD HEADING WEST TO TRAVEL UNDERNEATH I-5.
TURN LEFT ON TO THE ACCESS ROAD.
HEAD SOUTH AND TURN RIGHT, GO THROUGH THE WHITE SLOUGH WATER POLLUTION CONTROL PLANET MAIN GATE.
PARKING IS ON THE LEFT.

N

PROPOSED SOLAR PROJECT SITE

WHITE SLOUGH WATER POLLUTION CONTROL PLANT

Drawing name: M:\DATA\CAD\ENG\Cw\Co-Workers\Demy\White Slough\White Sough - Solar Project.dwg Plotted on: Aug 11, 2009 - 1:29pm

Lodi Electric Utility

Lodi Solar Demonstration Project

City Council
August 19, 2009

Solar Technologies

- Solar Concentrating (Thermal)
  - Trough
  - Dish/Sterling
  - Power Tower

- Solar Photovoltaic
  - Wafer-based Crystalline Silicon
  - Thin Film
  - Concentrating

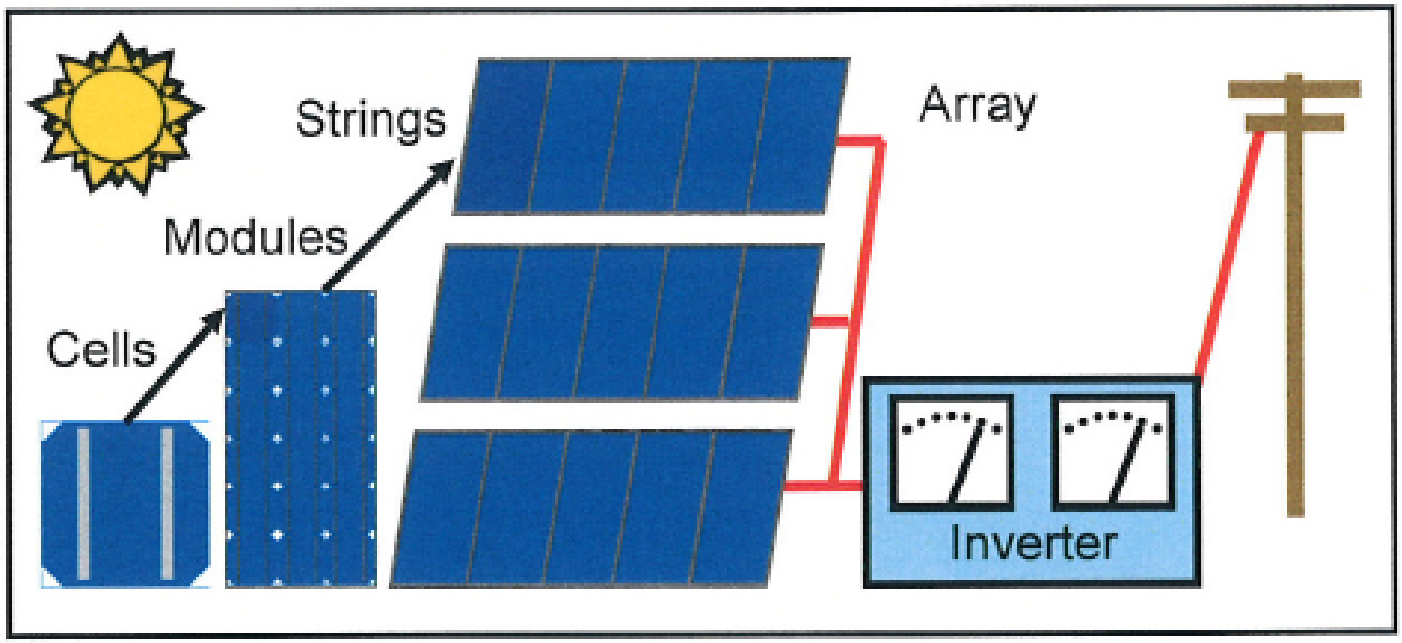
Solar Photovoltaics

- Photovoltaic (“PV” for short) is the word that describes converting sunlight into electricity
- “Photo” means pertaining to light
- “Voltaic” means producing voltage

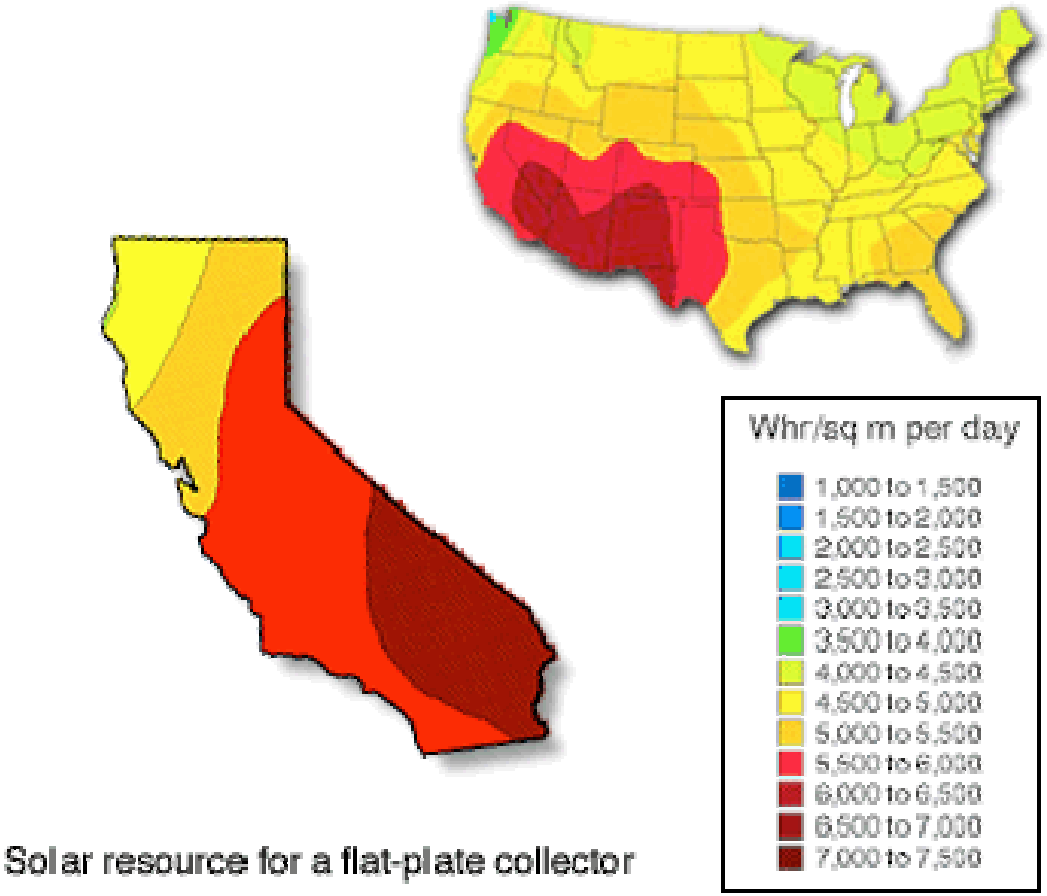
How Does PV Work?

- Sunlight is made of photons (particles of solar energy)
- When light (photons) strike a solar panel, electrons are displaced from the silicon atoms creating a flow or electric current
- The result is direct current (DC) which can be converted to alternating current (AC) with an inverter

Simple PV Schematic



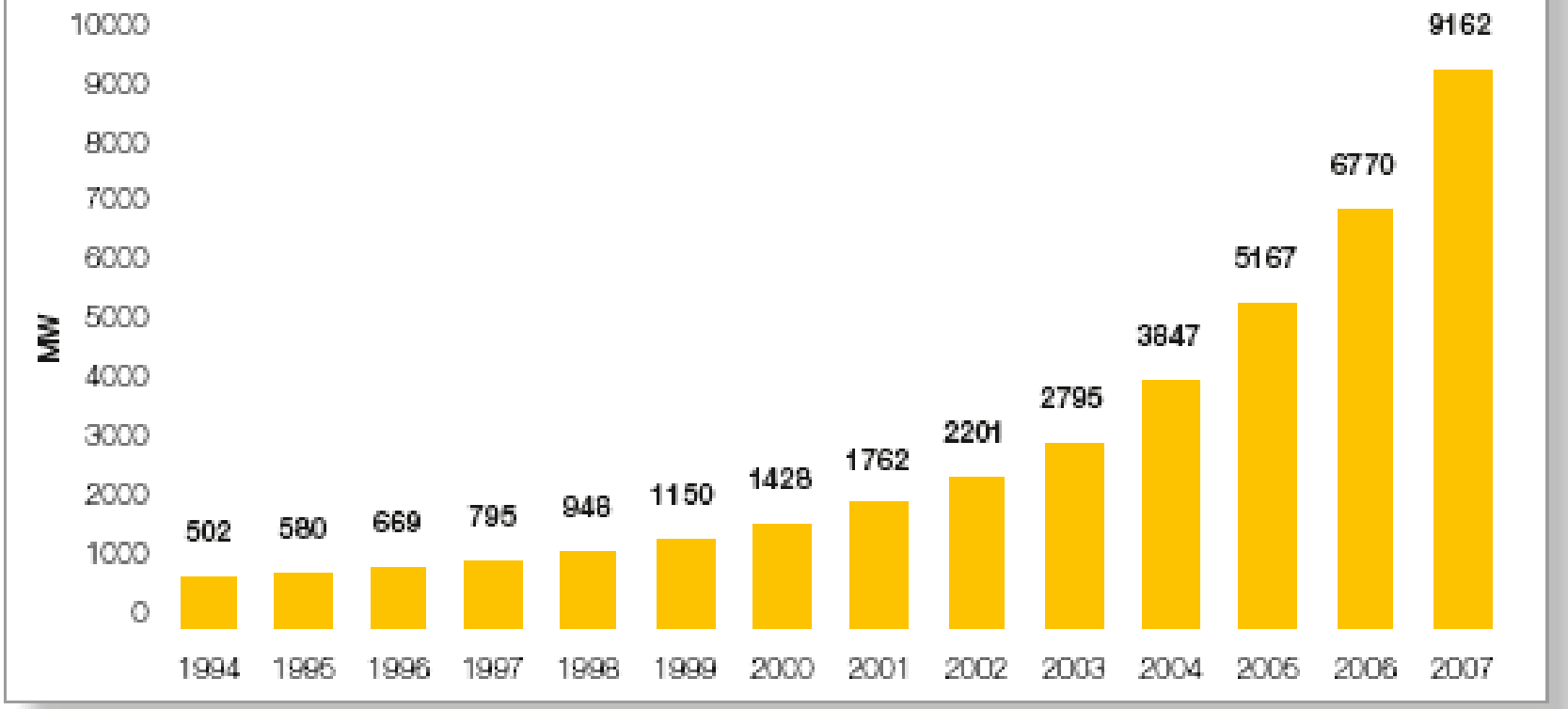
Solar Potential



Solar resource for a flat-plate collector

PV Growth

Figure 2.1: Global cumulative PV capacity



Solar Economics

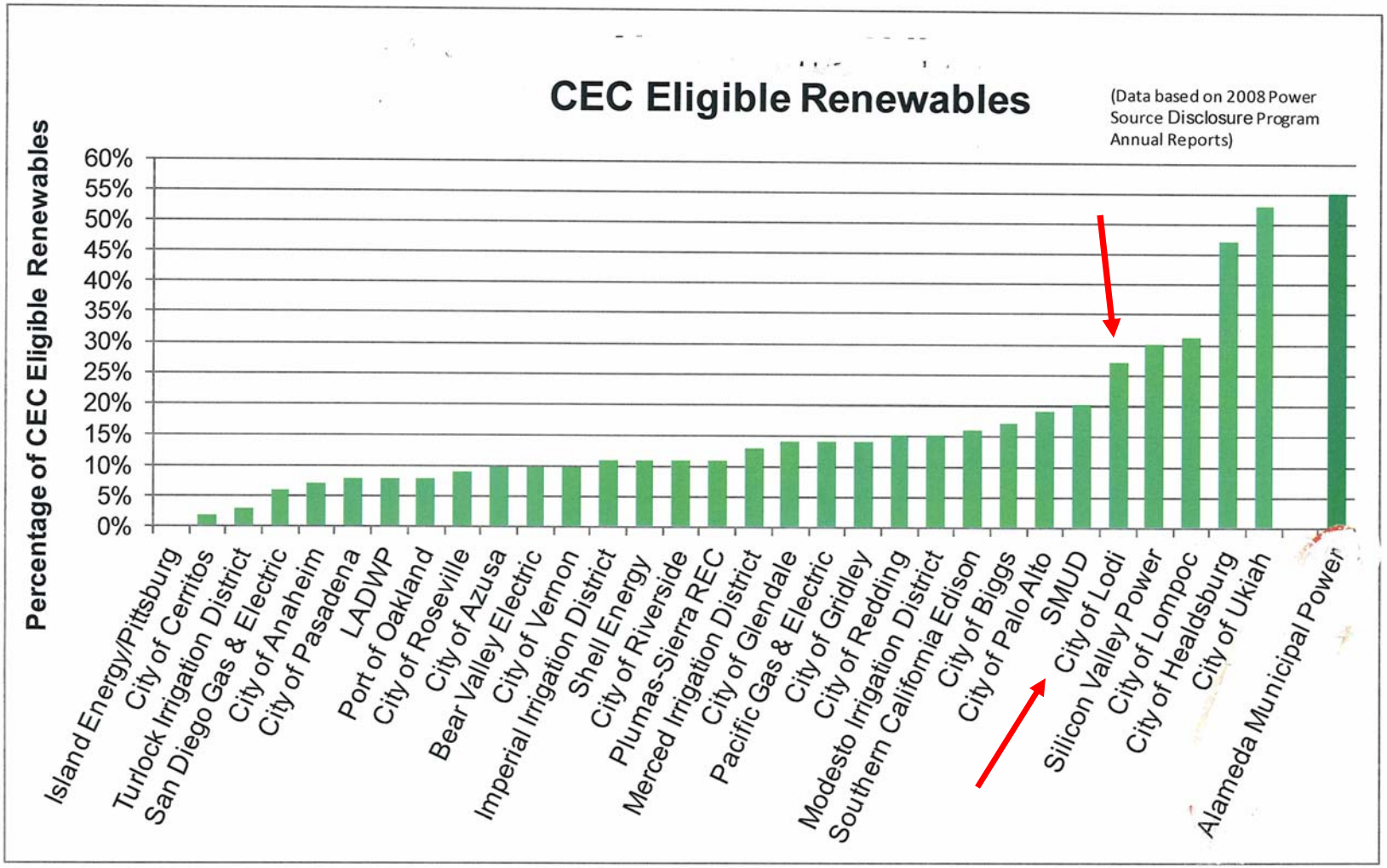
- Prices for new PV solar energy vary but are generally in the 12 to 20+ cents per KWH range
- Pricing/cost is still on the high side compared to other electric technolo

- Energy is high value since typically level of sunlight correlates well with electric demand

Renewable Standards (RPS)

- Current law requires private electric utilities to be 20% renewable by 2010
- Pending state legislation proposes to increase RPS to 33% by 2020.
- Lodi is approximately 25% qualified renewable today

REC Status


CEC Eligible Renewables
(Data based on 2008 Power Source Disclosure Program Annual Reports)
Percentage of CEC Eligible Renewables
60%
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Island Energy/Pittsburg
City of Cerritos
Turlock Irrigation District
San Diego Gas & Electric
City of Anaheim
City of Pasadena
LADWP
Port of Oakland
City of Roseville
City of Azusa
Bear Valley Electric
City of Vernon
Imperial Irrigation District
Shell Energy
City of Riverside
Plumas-Sierra REC
Merced Irrigation District
City of Glendale
Pacific Gas & Electric
City of Gridley
City of Redding
Modesto Irrigation District
Southern California Edison
City of Biggs
City of Palo Alto
SMUD
City of Lodi
Silicon Valley Power
City of Lompoc
City of Healdsburg
City of Ukiah
Alameda Municipal Power

Solar in Lodi Today

- **Residential**
  - 25 Systems
  - 105 kilowatts total
- **Commercial**
  - 11 Systems
  - 475 kilowatts total

Clark Pest Control	166 KW
Dependable Precision	132 KW
Plug-It Products	73 KW

Note: Lodi Electric Utility has rights in ~200 KW of solar installed at the Geysers and operated by NCPA

Lodi PV Demonstration

- Staff is proposing a PV demonstration project at a Lodi City facility
- White Slough Water Treatment Facility
- Qualifies for EUD's California Solar Initiative Rebate (presently $2.60 per watt)
- Goal to be a "showcase" project with community benefits

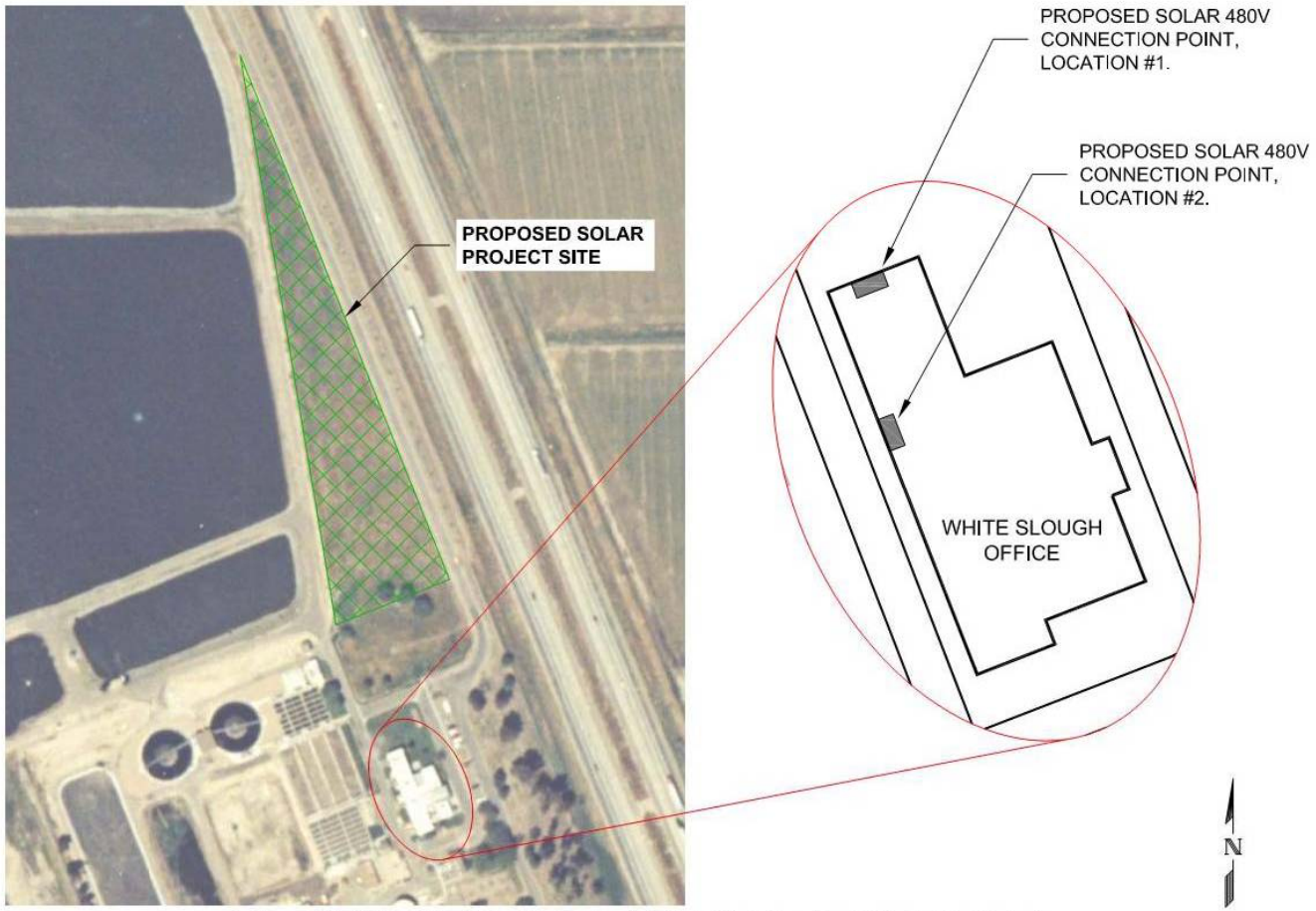
Proposals

- Must use photovoltaic technology
  - Fixed or tracking
  - Flat panel or reflecting
- Turnkey projects
- City to provide land
- In-service by June 1, 2010
- 25 year term with option for City to purchase system after 5 years
- Minimum 100 KW. Maximum is site dependent

Proposals (cont)

- Purchases made under Purchase Power Agreement (PPA)
- Preferred pricing of flat ¢/KWH with annual escalation, if needed
- EUD to receive all GHG, RPS and capacity attributes/credits
- Wastewater division to retain solar rebate
- Project will comply with EUD's metering and interconnection requirements.

Proposed PV Site



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Community Benefits

- Visibility of project and signage from I-5
- Promoting Lodi as a “green friendly” to new or relocating businesses in that sector
- Potential for future addition of new jobs
- Use of Lodi materials and labor on solar project where practical
- Providing societal value by demonstrating and supporting innovative technologies
- Reduction of green house gases

Grapes and PV

Project Evaluation Factors

- Award based on project evaluated to be in the best interest of City
- Pricing and economic impact of energy purchase
- Innovativeness and efficiency of proposed solar PV technology
- Experience and capability of bidder
- Buy-out option terms
- Other Purchase Power Agreement terms
- Proposed community benefits

Summary

- Solar energy is rapidly becoming a viable electricity producing technology
- Presently, local residences and businesses have installed over 500 KW of PV solar
- Proposed solar demonstration project at White Slough would be first solar at a City facility (other than EUD vehicle charging)
- Site would be highly visible from I-5 and promote Lodi as “green friendly”

Staff recommends approval to issue a RFP for solar